AERA

November 3, 2008

Mr. George Robin
US EPA Region IX
Ground Water Office, WTR-9
75 Hawthorne St.
San Francisco, CA 94105

Dear Mr. Robin:

SUBJECT: AQUIFER EXEMPTION EXPANSION– SOUTH BELRIDGE OILFIELD
KERN COUNTY

As we discussed at our meeting on October 22, 2008, enclosed please find revised Exhibits 1 and 8 and modified pages 2 (Project Summary, Project Justification) and 3 (Purpose of Project) that were changed to reflect the aquifer exemption boundary deemed mutually agreeable to Aera Energy LLC (Aera), the California Division of Oil, Gas and Geothermal Resources (DOGGR) and your agency at that meeting.

Thank you for your cooperation in this important project. Should you have any questions regarding the enclosures, please contact me at (661) 665-5641.

Sincerely,

Ron Chambers

R.L. Chambers
Lead Environmental, Health and Safety Advisor
Water, Waste & Remediation
rlc:dc

cc: With Enclosures

DOGGR – District 4
Mr. Burton Ellison

Project Summary

1. Field	South Belridge Oil Field
2. Injection Zone	From top of Tulare Pay-Above-A (PAA) sands to base of Tulare Fm.
3. Depth to Top of Zone	450 ft. (SE/4 Sec. 27) to 700 ft. (NE/4 Sec. 20)
4. Thickness of Injection Zone	1,100 ft. to 1,600 ft.
5. Areal Extent	7,040 acres
6. TDS of Injection Zone	Tulare A and B sands (Well 348L-27): TDS = 5,100 mg/L Chloride = 2,200 mg/L Sodium = 1,700 mg/L
7. TDS of Injection Fluids	Tulare produced water (Filter Plant 27): TDS = 13,000 mg/L Chloride = 7,200 mg/L Sodium = 3,900 mg/L Diatomite produced water (Filter Plant 20) TDS = 24,000 mg/L Chloride = 15,000 mg/L Sodium = 10,000 mg/L
8. Additional Class II Fluids	Regeneration brine (Water Plant 27) TDS = 10,000 mg/L Chloride = 6,200 mg/L Sodium = 4,900 mg/L
9. Miscellaneous Information	Injection zone is hydrocarbon productive ~500 ft. up-structure to the west
10. Drinking Water Declaration	Injection zone is not a source of drinking water per Regional Water Quality Control Board
11. Distance to Towns	Buttonwillow is ~15 miles to the southeast and Lost Hills is ~10 miles to the north
12. Land Use	Oil production and agriculture
13. Alternate Water Source	Spicer City water wells ~6.5 miles to the northeast
14. Unusual Geology	None

1 Project Description

1.1 Purpose of Project

The primary purpose of the proposed project is to expand the existing boundary of the Tulare Aquifer Exemption in the South Belridge Oil Field by adding all or portions of 14 Sections to the exempted area. The Tulare is an oil producing formation and exempt aquifer that has historically been used for injection disposal in western Kern County. A location map showing the existing disposal project boundary and proposed additions is provided as Exhibit 1. Also depicted on Exhibit 1 (green shaded areas) are proposed water disposal project areas that will be the subject of a Class II project application to the Division of Oil, Gas and Geothermal Resources (DOGGR) when the aquifer exemption has been approved.

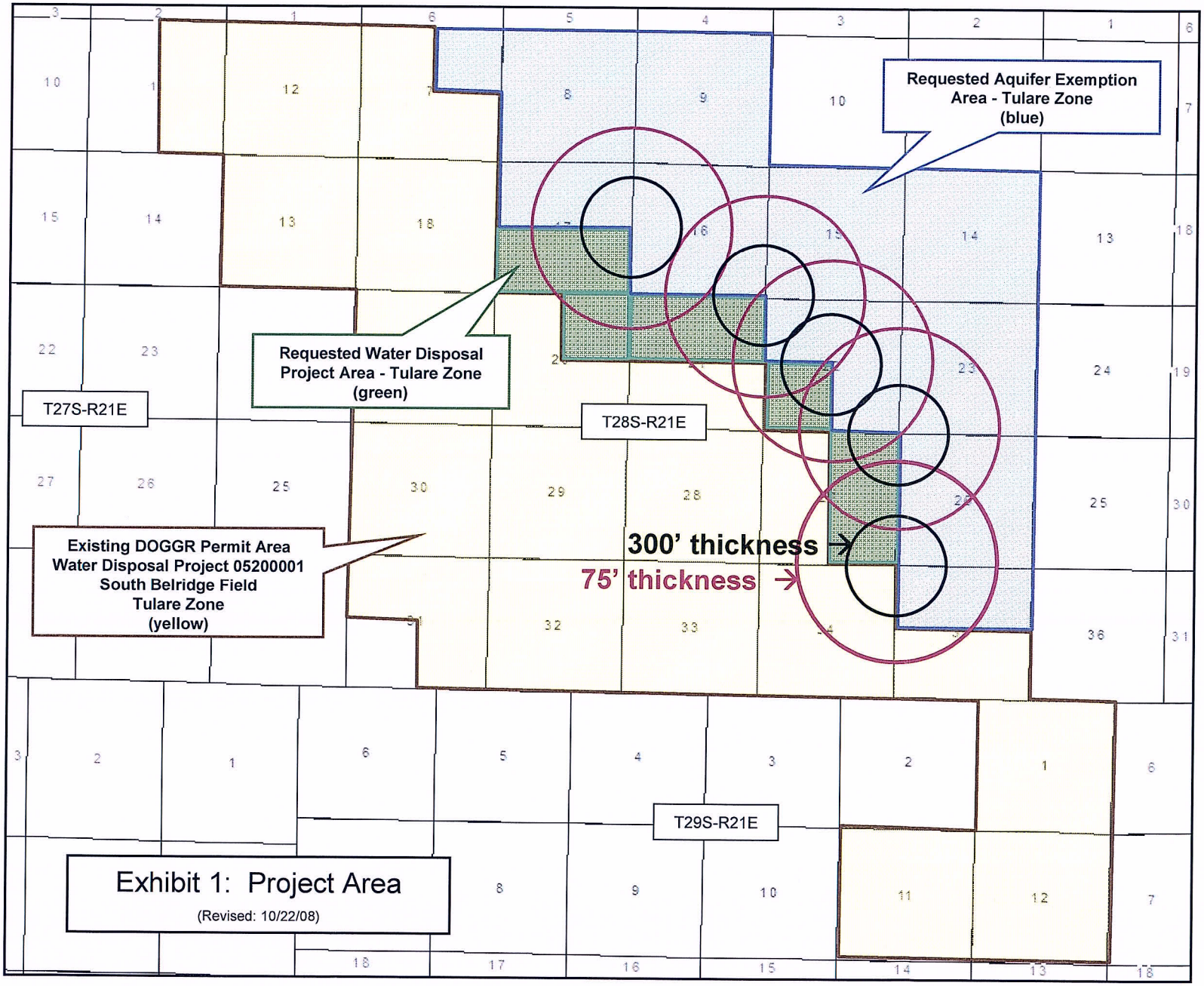
1.2 Project Justification

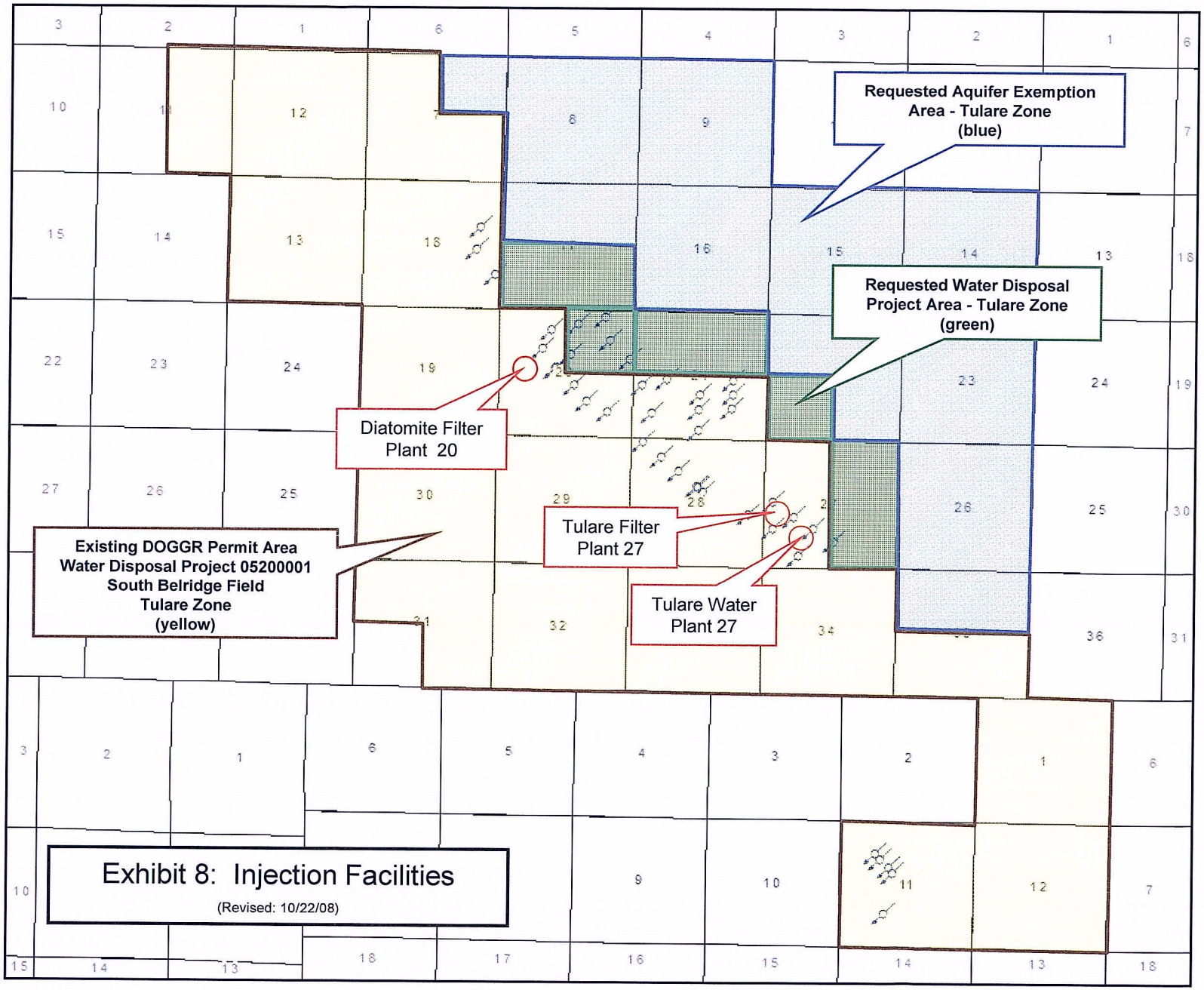
From a geologic perspective, the proposed water disposal project areas are structurally higher and closer to the oil-productive limits of South Belridge Field than portions of the existing project boundary, as shown on the enclosed structure map (Exhibit 2) and cross-sections (Exhibits 3 and 4) and the proposed exemption area has been modeled to ensure that through the life of the project injected water will stay within the exemption boundary on land owned by Aera Energy LLC (Aera). Additionally, the entire proposed injection interval, which is defined as being from the top of the Tulare Pay-Above-A (PAA) zone to the base of the Tulare Formation, is equivalent to oil producing zones along the eastern flank the field.

2 Engineering Study

2.1 Reservoir Characteristics of Injection Zone

Formation	Tulare
Porosity	28 - 42%
Permeability	430 - 3870 md
Thickness	1,100 - 1,600 ft.
Aerial Extent	640 acres (four ¼ sections)
Fracture Gradient	> 0.9 psi/ft
Formation Temperature	91 °F @ 1120 ft. to 115 °F @ 1450 ft.
Formation Pressure	125 psi @ 886 ft. to 204 psi @ 1083 ft.
Oil Saturation	0 - 1%
Water Saturation	99 - 100%


Requested Aquifer Exemption Area - Tulare Zone (blue)
Requested Water Disposal Project Area - Tulare Zone (green)
Existing DOGGR Permit Area
Water Disposal Project 05200001
South Belridge Field
Tulare Zone
(yellow)
300' thickness
75' thickness
T27S-R21E
T28S-R21E
T29S-R21E
Exhibit 1: Project Area
(Revised: 10/22/08)


Requested Aquifer Exemption Area - Tulare Zone (blue)
Requested Water Disposal Project Area - Tulare Zone (green)
Diatomite Filter Plant 20
Tulare Filter Plant 27
Tulare Water Plant 27
Existing DOGGR Permit Area
Water Disposal Project 05200001
South Belridge Field
Tulare Zone
(yellow)
Exhibit 8: Injection Facilities
(Revised: 10/22/08)